

WHAT IS CLAIMED IS:

1. A scale device comprising:

a scale unit including:

a scale member formed from a long member and which has position signals provided thereon and at least a pair of fixing holes formed across a region thereof carrying the position signals and away longitudinally thereof from each other; and

a case member having at least a pair of fixing holes formed therein away longitudinally thereof from each other and through each of which there is penetrated a fastening member to be screwed into a mounting hole formed in a first part of a machine to which the scale device is to be installed, and in which the scale member is housed and fixed for the fixing holes to communicate with the corresponding ones in the scale member; and

a detector to be installed to a second part, moving in relation to the first part, of the machine with the sensor being positioned opposite to the position signal carrying area on the scale member, and which detects travels of the first and second parts of the machine in relation to each other by the sensor moving relative to the scale member,

the scale unit being to be fixed to the first part of the machine with the fastening member penetrated through the fixing holes in the scale and case members and then screwed into the mounting hole in the first part of the machine to fasten the scale member and the case member together.

2. The scale device as set forth in claim 1, wherein the case and scale members are formed from materials, respectively, different in linear expansion coefficient from each other.
3. The scale device as set forth in claim 1, wherein the case member is formed from a steel sheet bent to have a generally U-shaped section, has the scale member housed therein and fixed to the inner surface of one of the lateral portions thereof, and has at least the pair of fixing holes formed in the lateral portion.
4. The scale device as set forth in claim 1, wherein the scale member is fixed to the case member with an adhesive which is resistant against flexible deformation.
5. The scale device as set forth in claim 1, further comprising a reinforcing means provided between opposite surfaces of the case and scale members, respectively.
6. The scale device as set forth in claim 5, wherein:
 - the scale member is fixed to the case member by bonding with an adhesive; and
 - the reinforcing means is formed from a plate-like reinforcing member having a thickness nearly equal to the layer thickness of the adhesive and has a fixing hole through which the fastening member is penetrated.
7. The scale device as set forth in claim 1, wherein:
 - the case member is formed from a steel sheet bent to have a generally U-shaped section, has the scale member housed therein and fixed to the inner surface of a first one of the lateral portions thereof, has a pair of fixing holes formed in the lateral portion away longitudinally thereof from each other;

a side case member is provided at either end of, and in combination with, the case member to close longitudinal opposite end openings of the case member;

there is provided between opposite surfaces of the case and scale members, respectively, a reinforcing member formed from a plate-like member having a thickness nearly equal to the layer thickness of the adhesive and having a fixing hole through which the fastening member is penetrated; and

the reinforcing member has a stopper piece formed bent integrally on one longitudinal end thereof and which is held in contact with the side case member to prevent any displacement of the latter.

8. The scale device as set forth in claim 1, wherein the scale member has one or more rib-shaped projections formed integrally on the side thereof opposite to the case member along the full length thereof and which is or are applied to the case member.

9. The scale device as set forth in claim 1, wherein:

the scale member is fixed, by bonding with an adhesive, to the case member and has a pair of rib-shaped projections formed integrally on the side thereof opposite to the case member along at least the longitudinal opposite edges thereof; and

the rib-shaped projections define the layer thickness of an adhesive applied to the side of the scale member opposite to the case member.

10. The scale device as set forth in claim 1, wherein the fastening member has a washer member fitted on the thread portion thereof for interposition between the head portion thereof and the side of the scale member opposite to the case member.

11. The scale device as set forth in claim 10, wherein:

the case member is formed to have a generally U-shaped section, has the scale member fixed, by bonding with an adhesive, to the inner surface of a first lateral portion thereof, has a pair of fixing holes formed in the first lateral portion away longitudinally thereof from each other, and has guide holes formed in a second lateral portion thereof opposite to the first lateral portion, each of the guide holes being corresponding to the fixing holes in the first lateral portion and having an inside diameter large enough to allow the fastening member to penetrate through; and

the washer member is larger in diameter than the guide hole.

12. The scale device as set forth in claim 1, wherein each of the case member and scale member has a second fixing means of a force-fit structure formed in a position different from the fixing holes formed therein and outside the position signal carrying area.